



Lessons from the Bay

Grasses, Grasses Everywhere

How are underwater grasses similar to the grass in the schoolyard? What do grasses need, and how do they benefit their environment?

Objectives

Students will

- observe, analyze, and classify grasses
- organize findings into meaningful categories
- compare and contrast two different types of grasses.

Background

The grasses in the schoolyard and grasses that grow underwater are alike in many ways. Both of them require certain elements from their environments in order to survive, and both give back to their environments by providing ecological balance and life-sustaining elements for other organisms.

Like other green plants, the grasses in the schoolyard require light, nutrients, and water in order to survive. They provide habitat and food for small organisms. Grasses give off oxygen and thus contribute to the survival of all organisms on earth. The roots of grasses offer stability to the soil and help prevent erosion. Grass, like other types of vegetation, also works as a natural water filter. As rainwater flows over it, grass catches pollutants and sediment before these harmful elements enter creeks and streams.

Likewise, submerged aquatic vegetation (SAV) provides an essential link in the balanced health of the Chesapeake Bay and its tributaries. Like grass in the schoolyard, SAV requires light, water, and nutrients to survive. In turn, these grasses produce the oxygen necessary for the survival of underwater organisms. Underwater grasses, such as wild celery, eelgrass, and widgeon grass, provide shelter for fish, shellfish, and many other invertebrates. SAV provides food for waterfowl as well as for the animals it shelters. SAV helps to maintain water quality and clarity, working as a natural filter to trap sediment. SAV roots provide stability to the bottom of the Bay and its tributaries, playing a vital link in preventing erosion and further sediment pollution. SAV absorbs nutrients for its own benefit, and this in turn benefits the underwater environment by helping to keep nutrient levels in check.

Related Standards of Learning

Science:

3.1; 3.4.a; 3.6.b; 3.6.c; 3.7.a;
3.10.a; 4.1.a; 4.4.a; 4.4.c; 4.5;
4.8.a; 4.8.b; 4.4.d; 5.1.a; 5.1.b;
5.1.e; 5.5.b; 5.5.c; 5.6.c; 6.1.a;
6.1.b; 6.1.h; 6.1.i

Mathematics:

3.14.a; 4.11.a; 4.13.a; 5.8; 5.10;
5.11.a; 5.11.d; 6.9.a; 6.9.d; 6.10

English:

3.1; 3.4; 4.1; 4.3; 4.7.a; 4.7.b;
4.7.c; 4.7.d; 4.7.e; 4.8; 5.1; 5.7.b;
5.8; 6.2; 6.3

History and Social Science:

VS.1.b; VS.1.d; VS.1.h; USI.1.e

Time Required

Two 45-minute sessions

Materials

- transparency of *Underwater Grasses graphic organizer* (handout, page 63)

For each student:

- *Underwater Grasses graphic organizer* (handout, page 63)
- *Who Killed SAV?* (booklet following this lesson plan, pages 65–74)

For each group:

- *Schoolyard Grass Worksheet* (handout, page 61)
- ruler
- scissors
- protractor (optional)
- sheet of poster paper (at least 1-1/4 square feet)
- clipboard (if available) or other suitable writing surface

Procedures

Session 1 (45 minutes)

Begin this session in the classroom.

1. Divide the class into groups of 2–3 students. Provide each group with a ruler, protractor, scissors, and a sheet of poster paper. Instruct students to cut a 1-foot-square opening in the poster paper sheet, leaving at least a 3-inch border around the square.
2. Conduct a discussion of grasses, and record students' comments and predictions on the board. (You will add to this list later.) Center the discussion around the following questions:
 - *What does grass need in order to survive?*
 - *What does the grass give back to the environment?*
3. After adequate discussion, distribute to each group of students a Schoolyard Grass Worksheet, and move to the schoolyard.

Continue in the schoolyard.

4. Direct each group to place their square cutout on a section of grass in the schoolyard. Allow students about 15 minutes to observe their grass samples. Instruct each group to illustrate their sample in the box at the top of the worksheet and to complete the chart at the bottom of the worksheet.
5. As students finish their worksheets, ask the students to share their observations.

Continue in the classroom.

6. Return to the classroom, and review the list of comments and predictions. Allow students to make amendments to the list.
7. Ask students to find common items in the list and to name some categories into which the items might be grouped. Have students group the items and defend their choices.
8. Display the transparency of the Underwater Grasses graphic organizer. Compare the categories listed on the graphic organizer to those created by the students. As a class, fill in the category ovals based on students' observations of their schoolyard grass samples.

Session 2 (45 minutes)

Conduct this session in the schoolyard.

1. Ask students to suggest different places grasses are found. If they do not arrive at it

independently, inform them that grasses can be found in water. Discuss underwater grasses, and, as in Session 1, record students' comments and predictions on the board. Again, center the discussion on the following questions:

- *What do underwater grasses need in order to survive?*
 - *What do underwater grasses give back to the environment?*
2. Distribute a copy of the booklet *Who Killed SAV?* to each student. Have students read pages 1–5. (The remainder of the story is read in the lesson “Who Killed SAV?”).
 3. Return to the list on the board, and ask students to add to it, using what they learned from the reading.
 4. Ask students to point out common items in the list and to name possible categories.
 5. Display the transparency of the Underwater Grasses graphic organizer. Show students the categories on this organizer again, comparing them to the categories they created. *Which of these categories reflect SAV benefits to the environment? Which reflect SAV requirements for survival?*
 6. Distribute copies of the Underwater Grasses graphic organizer, and instruct students to fill in the ovals.
 7. After the organizer has been completed, generate a discussion in which students compare and contrast underwater grasses with those found in the schoolyard.

Resources

“Bay Grasses.” *Chesapeake Bay*. Maryland Dept. of Natural Resources.
<<http://www.dnr.state.md.us/bay/sav>>.

“Bay Grasses.” Chesapeake Bay Program.
<<http://www.chesapeakebay.net/baybio.htm>>.

Bay Journal 7.10 (Jan.–Feb. 1998). Alliance for the Chesapeake Bay.
<<http://www.bayjournal.com/98-02/index.htm>>.

Chesapeake Bay Foundation.
<<http://www.cbf.org>>.

Chesapeake Bay Foundation. *Watershed Action for Virginia's Environment (WAVE)*.

(See <http://www.cbf.org/site/PageServer?pagename=edu_educators_curriculum_va_index>, or contact the Virginia Office: Capitol Place, 1108 E. Main Street, Suite 1600, Richmond, VA 23219; phone 804-780-1392.)

Chesapeake Bay Foundation Guide to Underwater Grasses. Flash guide. Chesapeake Bay Foundation. <http://www.cbf.org/site/DocServer/Guide_to_Underwater_Grasses.pdf?docID=116>.

Chesapeake Bay Foundation, and Maryland Dept. of Natural Resources. *Bay Grasses in Classes*. (See <http://www.cbf.org/site/PageServer?pagename=edu_educators_restoration_grasses>.)

Chesapeake Bay Program. <<http://www.chesapeakebay.net>>.

ChesSIE: Chesapeake Science on the Internet for Educators. Chesapeake Bay Program. <<http://www.bayeducation.net>>.

Ross, Bill. *Straight from the Bear's Mouth*. New York: Atheneum, 1995. ASIN 0689317263.

Royston, Angela. *How Plants Grow*. Heineman Library, 1999. ISBN 1575728249.

Silver, Donald M., and Patricia J. Wynne. *Swamp*. One Small Square. New York: McGraw-Hill, 1997. ISBN 0070579261.

"Submerged Aquatic Vegetation: Where Have All the Grasses Gone?" Chesapeake Bay Field Office, U.S. Fish and Wildlife Service. <<http://www.fws.gov/r5cbfo/CBSAV.HTM>>.

Telford, Carole, and Rod Theodorou. *Down a River*. Amazing Journeys. Heineman Library, 1998. ISBN 157721538.

Classroom Assessment Suggestions

- *Graphic organizers*
- *Accuracy of illustration and chart data on student worksheets*
- *Discussion of grass sample observations*
- *Categorization of grass-related items*

Extensions for Students

- *See "Who Killed SAV?" lesson plan (page 75).*
- *Participate in the Chesapeake Bay Foundation's Bay Grasses in the Classes Restoration Program (see Resources).*
- *Examine underwater grass and grass from the schoolyard under a microscope to observe similarities and differences in greater detail.*
- *Write a story from the perspective of a blade of grass (either in the schoolyard or underwater) illustrating the role that blade of grass plays in its ecosystem.*
- *Illustrate the Who Killed SAV? book as a means of demonstrating comprehension of the text.*
- *Create a simple Venn diagram comparing and contrasting schoolyard grass with underwater grasses.*

Who Killed SAV?

Assembly Instructions

1. Print the booklet on back-to-back pages. (If your printer will not print back-to-back, you can tape page 2 to the back of page 1, page 4 to the back of page 3, etc.)
2. Fold the pages down the middle and staple together along the fold.